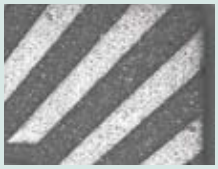
QV ELF

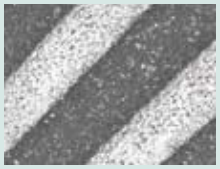
SERIES 363 — CNC Vision Measuring System

Programmable Power Turret (PPT)

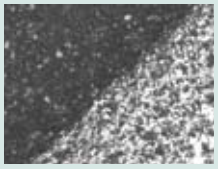
The three tube lens selection provides three magnification levels while the same objective lens. Replacement objective lenses allow a wide range of magnifications to support a variety of measurements.



1X tube lens x 2.5X objective
View field: 2.5 x 1.88 mm



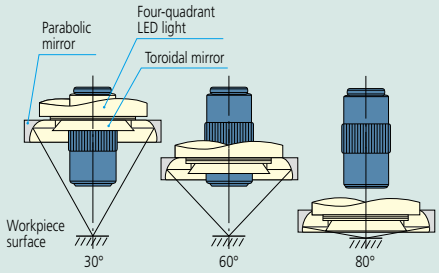
2X tube lens x 2.5X objective
View field: 1.25 x 0.94 mm



6X tube lens x 2.5X objective
View field: 0.41 x 0.31 mm

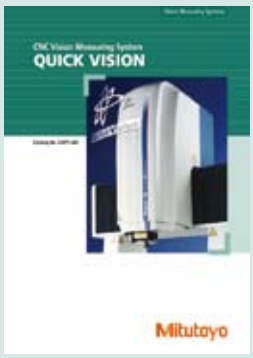
Programmable Ring Light (PRL)

Fine control of obliquity and direction provides illumination optimal for measurement. Obliquity can be arbitrarily set in the range from 30° to 80°. This type of illumination is effective for enhancing the edge of inclined surfaces or very small steps. Illumination can be controlled independently in every direction, back and forth, right and left. Measurement with edge enhancement is possible by forming a shadow by lighting from only one direction.



Laser Auto Focus (LAF) Function*

Mitutoyo offers models featuring the LAF system which enables high-speed focusing. Refer to page N-7 for more details. *Available on the PRO model.



Refer to the QUICK VISION leaflet (E4125) for more details.

FEATURES

- With a controller-integrated compact size design, this light weight, space saving series is appropriate for installation anywhere where space is limited.
- With a small boy and full funcitionality, this series offers various types of machines equipped with the PRL iluminator and power turret.
- The highest performance/cost ratio of the series.

QV ELF202PRO

SPECIFICATIONS

Model No. and Type		QV ELF202PT	QV ELF202PRO
Range	X-axis	200mm	
	Y-axis	250mm	
	Z-axis	100mm	
Resolution		0.1µm	
High-sensitivity CCD camera		B&W	
Accuracy*	E_{1XY}	(2.0+3L/1000)µm	
	E_{1Z}	(4.0+5L/1000)µm	
Max. drive speed (X/Y/Z-axis)		100mm/s	
Illumination (PRL: Programmable Ring Light)	Surface	Halogen	Halogen
	Contour	Halogen	Halogen
	Ring light	Halogen	PRL (LED, white)
Magnification change system		Programmable power turret	
Stage glass size		269 x 311mm	
Max. stage loading		10kg	
Mass		195kg	

* The measuring accuracy is defined at the following conditions
Programmable power turret: 1X Objective set: 2.5X
L = Dimension between two arbitrary points (mm)

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Mitutoyo

QV Apex / Hyper QV

SERIES 363 — CNC Vision Measuring System

QV Apex302PRO

Hyper QV404PRO

QV Apex606PRO

SPECIFICATIONS

Model No.		QV Apex302PRO QV Apex302PRO2 QV Apex302PRO3 Hyper QV302PRO	QV Apex404PRO QV Apex404PRO2 QV Apex404PRO3 Hyper QV404PRO	QV Apex606PRO QV Apex606PRO2 QV Apex606PRO3 Hyper QV606PRO
Range	X-axis	300mm	400mm	600mm
	Y-axis	200mm	400mm	650mm
	Z-axis	200mm	250mm	250mm
Resolution		0.1µm [0.02µm]		
High-sensitivity CCD camera		B&W (PRO3 model: color)		
Accuracy*	E_{1XY}	(1.5+3L/1000)µm [(0.8+2L/1000)µm]		
	E_{1Z}	(1.5+4L/1000)µm [(1.5+2L/1000)µm] [PRO2 model: (4.0+5L/1000)µm]		
	E_{2XY}	(2+4L/1000)µm [(1.4+3L/1000)µm] [PRO2 model: (2.5+4L/1000)µm]		
Illumination (PRL: Programmable Ring Light)	Surface	LED, RGB (PRO2 and PRO3 models: Halogen)		
	Contour	LED, white (PRO2 and PRO3 models: Halogen)		
	PRL	LED, RGB (PRO2 and PRO3 models: Halogen)		
Magnification change system		Programmable power turret (PRO2 model: Programmable power zoom lens)		
Max. drive speed	X/Y-axis	300mm/s [200mm/s]	400mm/s [200mm/s]	400mm/s [200mm/s]
	Z-axis	300mm/s [200mm/s]	300mm/s [200mm/s]	300mm/s [200mm/s]
Stage glass size		399 x 271mm	493 x 551mm	697 x 758mm
Max workpiece height		200mm	250mm	250mm
Max. stage loading		20kg [15kg]	40kg [30kg]	50kg [40kg]
Dimensions (W x D x H)**		859 x 951 x 1609mm	1027 x 1407 x 1778mm	1309 x 1985 x 1794mm
Mass**		360kg	579kg	1450kg

* The measuring accuracy is defined at the following conditions, Programmable power turret: 1X, Objective set: 2.5X, L = Dimension between two arbitrary points (mm)
In PRO2, the zoom magnification is 3X.
** Including machine stand

Refer to the QUICK VISION leaflet (E4125) for more details.

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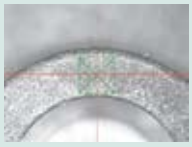
QV ACCEL

SERIES 363 — CNC Vision Measuring System

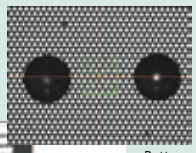
Image Multi-AutoFocus

The optimal focus can be selected for each surface texture and measured feature, realizing high reproducibility and reliable edge detection.



Surface focus

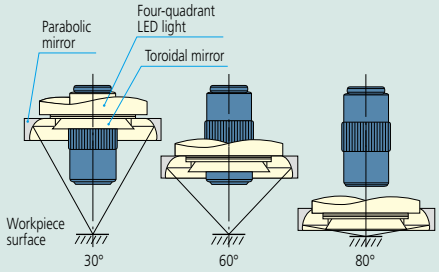
Edge focus



Pattern focus

Programmable Ring Light (PRL)

Fine control of obliquity and direction provides illumination optimal for measurement. Obliquity can be arbitrarily set in the range from 30° to 80°. This type of illumination is effective for enhancing the edge of inclined surfaces or very small steps. Illumination can be controlled independently in every direction, back and forth, right and left. Measurement with edge enhancement is possible by forming a shadow by lighting from only one direction.



RGB Color LED Illumination

Changing the illumination color to red, green, blue, or white (synthesized) allows detection of edges which could not be measured with conventional white light.

Laser Auto Focus (LAF) Function*

Mitutoyo offers models featuring the LAF system which enables high-speed focusing. Refer to page N-7 for more details. *Available to PRO2 / 3 models.

Optional Index table*

Automatic multi-plane measurement is possible with the optional index table. Refer to page N-7 for more details.
*Not available with QV ACCEL models

Optional Accessories: Refer to page N-7.

FEATURES

Moving-bridge type structure

Designed with primary focus on measurement efficiency, the machine adopts a more rigid construction and drives the X and Y axes at 400mm/s (QV ACCEL808, ACCEL1010), which is approximately 30% faster than that of standard QV Apex models. The moving-bridge type structure also eliminates the need for a moving stage. This facilitates a more simplified design of the workpiece fixture, resulting in a significant reduction in the man-hours required for fixture fabrication and inspection.

QV ACCEL808PRO

QV ACCEL1212PRO

SPECIFICATIONS

Model No.		QV ACCEL808PRO QV ACCEL808PRO3	QV ACCEL1010PRO QV ACCEL1010PRO3	QV ACCEL1212PRO QV ACCEL1212PRO3	QV ACCEL1517PRO QV ACCEL1517PRO3
Range	X-axis	800mm	1000mm	1250mm	1500mm
	Y-axis	800mm	1000mm	1250mm	1750mm
	Z-axis	150mm	150mm	100mm	100mm
Resolution		0.1µm			
High-sensitivity CCD camera		B&W (PRO3 model: color)			
Accuracy*	E_{1XY}	(1.5+3L/1000)µm		(2.2+3L/1000)µm	
	E_{1Z}	(1.5+4L/1000)µm		(2.5+5L/1000)µm	
	E_{2XY}	(2.5+4L/1000)µm		(3.5+4L/1000)µm	
Max. drive speed	X/Y-axis	400mm/s		300mm/s	
	Z-axis	150mm/s		150mm/s	
Illumination (PRL: Programmable Ring Light)	Surface	LED, RGB (PRO3 models: Halogen)			
	Contour	LED, white (PRO3 models: Halogen)			
	PRL	LED, RGB (PRO3 models: Halogen)			
Magnification change system		Programmable power turret			
Stage glass size		883 x 958mm	1186 x 1186mm	1440 x 1440mm	1714 x 1968mm
Dimensions (W x D x H)		1475 x 1716 x 1578mm	1912 x 2086 x 1603mm	2166 x 2340 x 1554mm	2440 x 2868 x 1554mm
Mass		2570kg	2950kg	3600kg	4500kg

* The measuring accuracy is defined at the following conditions, Programmable power turret: 1X, Objective set: 2.5X, L = Dimension between two arbitrary points (mm)

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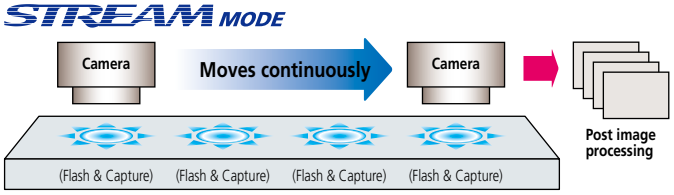
Mitutoyo

QV STREAM PLUS

SERIES 363 — CNC Vision Measuring System

QV STREAM PLUS 606



Choice of based machine
In addition to the standard QV Apex is available as a based machine.

QV Apex 302

QV STREAM PLUS 404

SPECIFICATIONS

Model No.		QV STREAM PLUS 302	QV STREAM PLUS 404	QV STREAM PLUS 606
Range	X-axis	300mm	400mm	600mm
	Y-axis	200mm	400mm	650mm
	Z-axis	200mm	250mm	250mm
Resolution		0.1µm		
High-sensitivity CCD camera		B&W, progressive scan CCD		
Accuracy*	E_{1XY}	(1.5+3L/1000)µm		
	E_{1Z}	(1.5+4L/1000)µm		
	E_{2XY}	(2.0+4L/1000)µm		
Max. drive speed (X/Y/Z-axis)		300mm/s	XY: 400mm/s, Z:300mm/s	XY: 400mm/s, Z:300mm/s
Max. measuring speed		40mm/s	40mm/s	40mm/s
Illumination (PRL: Programmable Ring Light)	Surface	Hi-intensity LED [stroboscopic (B) and continuous (RGB & W) illumination, switchable]		
	Contour	Hi-intensity LED [stroboscopic (B) and continuous (B) illumination, switchable]		
	PRL	Hi-intensity LED [stroboscopic (B) and continuous (RGB & W) illumination, switchable]		
Magnification change system		Programmable power turret		
Stage glass size		399 x 271mm	493 x 551mm	697 x 758mm
Max. stage loading		20kg	40kg	50kg
Dimensions (W x D x H)**		859 x 951 x 1609mm	1027 x 1407 x 1778mm	1309 x 1985 x 1794mm
Mass**		360kg	579kg	1450kg

* The measuring accuracy is defined at the following conditions
Programmable power turret: 1X Objective set: 2.5X
L = Dimension between two arbitrary points (mm)
** Including machine stand

FEATURES

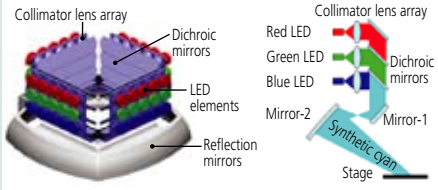
Non-stop Vision Measurement Extreme Improvement in Throughput*
Conventional vision measuring systems endlessly repeat the cycle of stage displacement, stage stop, measurement, stage start and stage displacement again. This mode of operation is a fundamental limitation on improving measurement throughput.
In contrast, the Quick Vision Stream system uses an innovative image capture technique that avoids the need to repeatedly stop the stage so measurement can be continuous, but measuring accuracy is retained. Eliminating the time needed to accelerate, decelerate and then hold the stage motionless while a measurement is made achieves a extreme improvement in productivity.

Measurement Throughput Comparison between QV STREAM and the Conventional System
STREAM PLUS series: more than 5 times
* Comparison of measurement throughput using a Mitutoyo sample workpiece with that of Mitutoyo conventional systems

STREAM Mode
The measurement mode of a non-stop vision measuring system is referred to as the STREAM mode.

Newly Developed Stroboscopic Illumination System
The development of a high-intensity LED flash illuminator made non-stop vision measurement possible. At the precise moment the stage reaches a measurement point the illuminator creates an extremely short, high-intensity flash that effectively freezes all motion. The illuminator turns on and off so fast that no image blur occurs and the image is captured in full and accurate detail.
This innovative design takes full advantage of high-density, high-intensity LED arrays aided by collimating lenses and dichroic mirrors to produce ultra bright, directional and efficient illumination.

High-density mounting of ultra-high intensity LED elements



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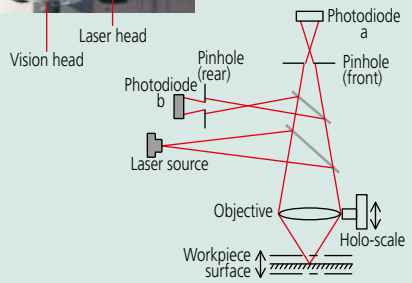
QV HYBRID TYPE1, TYPE3

SERIES 365 — CNC Vision Measuring System

FEATURES: Hybrid Type1

- The focusing point method minimizes the difference in the measuring face reflectance and realizing high measurement reporducibility.
- The double pinhole method (less directivity) is employed as the measurement principle.



Laser Beam Safety Precautions

This system uses a low-power invisible laser beam (780nm) which corresponds to a CLASS 1 (invisible radiation) of IEC60825-1 for measurement. The CLASS 1 laser warning label as shown below is attached to the main unit.

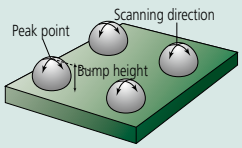
CLASS 1 LASER PRODUCT
クラス1 レーザ製品

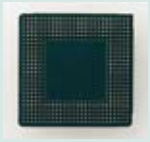
FEATURES: Hybrid Type3

- Enables surface roughness or thickness measurement of thin and transparent objects such as film.
  Measurable thickness: 25 to 300µm
- Enables detection of high inclination angles both for mirrored surfaces and diffusing surfaces.
  Maximum tracking inclination angle ±87° (diffusing surface)
- Realizes high-resolution and high-accuracy height measurement by the wavelength confocal method using axial chromatic aberration.
  *For Type3, due to the white halogen light, it is not applicable to JIS C 6802 "Radiation safety standard of laser products".

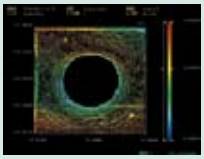
Applications

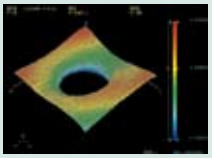
- Measurement of BGA/CSP bump height and coplanarity of IC packages



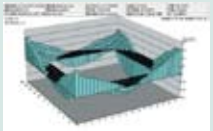


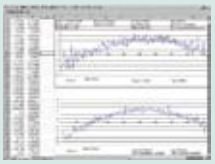
- Curved-form analysis (MSHAPE-QV)
  2D/3D contour lines display
  2D/3D unfiltered profile display
  Shadow graph display
  Curved plane analysis
  Unfiltered profile analysis, etc.





- Data processing (QV Graph)
  3D Bar chart display
  3D Surface chart display
  2D continuous cross-section graph display





FEATURES

The Quick Vision Hybrid is a complex machine which allows vision measurement with both a CCD camera and high-speed scanning by applying a vision measurement unit in parallel with a non-contact displacement sensor.

QVH Apex404

SPECIFICATION: QV Apex-based

Model No.			QVH Apex302	QVH Apex404	QVH Apex606
Range	Vision		300 x 200 x 200mm	400 x 400 x 250mm	600 x 650 x 250mm
	Non-contact displacement sensor	Type1	180 x 200 x 200mm	280 x 400x 250mm	480 x 650 x 250mm
		Type3	176 x 200 x 200mm	276 x 400 x 250mm	476 x 650 x 250mm
Accuracy**	E_{1XY}		(1.5+3L/1000)µm		
	E_{1Z}		(1.5+4L/1000)µm / (1.5+4L/1000)µm*		
	E_{2XY}		(2.0+4L/1000)µm		

* Using Non-contact displacement sensor
** The measuring accuracy is defined at the following conditions
Programmable power turret: 1X, Objective set: 2.5X, L = Dimension between two arbitrary points (mm)

SPECIFICATION: QV STREAM PLUS-based

Model No.			QVH STREAM PLUS302	QVH STREAM PLUS404	QVH STREAM PLUS606
Range	Vision		300 x 200 x 200mm	400 x 400 x 250mm	600 x 650 x 250mm
	Non-contact displacement sensor	Type1	180 x 200 x 200mm	280 x 400 x 250mm	480 x 650 x 250mm
		Type3	176 x 200 x 200mm	276 x 400 x 250mm	476 x 650 x 250mm
Accuracy**	E_{1XY}		(1.5+3L/1000)µm		
	E_{1Z}		(1.5+4L/1000)µm / (1.5+4L/1000)µm*		
	E_{2XY}		(2.0+4L/1000)µm		

* Using Non-contact displacement sensor
** The measuring accuracy is defined at the following conditions
Programmable power turret: 1X, Objective set: 2.5X, L = Dimension between two arbitrary points (mm)

SPECIFICATION: Hyper QV-based

Model No.			Hyper QVH302	Hyper QVH404	Hyper QVH606
Range	Vision		300 x 200 x 200mm	400 x 400 x 250mm	600 x 650 x 250mm
	Non contact displacement sensor	Type1	180 x 200 x 200mm	280 x 400 x 250mm	480 x 650 x 250mm
		Type3	176 x 200 x 200mm	276 x 400 x 250mm	476 x 650 x 250mm
Accuracy**	E_{1XY}		(0.8+2L/1000)µm		
	E_{1Z}		(1.5+2L/1000)µm / (1.5+2L/1000)µm*		
	E_{2XY}		(1.4+3L/1000)µm		

* Using Non-contact displacement sensor
** The measuring accuracy is defined at the following conditions
Programmable power turret: 1X, Objective set: 2.5X, L = Dimension between two arbitrary points (mm)

SPECIFICATION: QV ACCEL-based

Model No.			QVH ACCEL808	QVH ACCEL1010	QVH ACCEL1212	QVH ACCEL1517
Range	Vision		800 x 800 x 150mm	1000 x 1000 x 150mm	1250 x 1250 x 100mm	1500 x 1750 x 100mm
	Non contact displacement sensor	Type1	680 x 800 x 150mm	880 x 1000 x150mm	1130 x 1250 x 100mm	1380 x 1750 x 100mm
Accuracy**		E_{1XY}	(1.5+3L/1000)µm		(2.2+3L/1000)µm	
		E_{1Z}	(1.5+4L/1000)µm / (1.5+4L/1000)µm*		(2.5+5L/1000)µm / (1.5+4L/1000)µm*	
		E_{2XY}	(2.5+4L/1000)µm		(3.5+4L/1000)µm	

* Using Non-contact displacement sensor
** The measuring accuracy is defined at the following conditions
Programmable power turret: 1X, Objective set: 2.5X, L = Dimension between two arbitrary points (mm)

Main Unit Startup System

This machine incorporates a startup system (relocation detection system), which disables operation when an unexpected vibration is applied or the machine is relocated. Be sure to contact your nearest Mitutoyo prior to relocating this machine after initial installation. Refer to page IX for details.

Mitutoyo

ULTRA QV

SERIES 363 — Ultra-high Accuracy CNC Vision Measuring System

FEATURES

- Minimizes straightness errors through the use of a precision air-bearing linear guide system.
- Utilizes a 0.01µm resolution glass scale manufactured at an ultra-precision facility located eleven meters underground.
- Minimizes accuracy fluctuation against thermal change through the use of virtually zero thermal expansion glass scales.
- Optimizes the mechanical structure of the main unit in Finite Element Method analysis.
- Stabilizes the geometrical accuracy (i.e. straightness of each axis and perpendicularity) to lessen thermal effects.

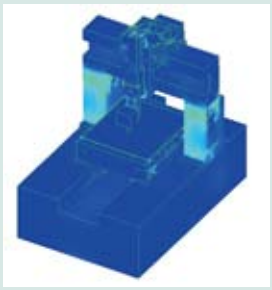
ULTRA QV404 PRO

Standard glass scale

Ultra-high accuracy crystallized glass scale with virtually zero thermal expansion

The Ultra Quick Vision is equipped with a crystallized glass scale having a resolution of 0.01µm and linear expansion coefficient of 0.08×10^{-6}/K. This virtually zero thermal expansion means the Ultra Quick Vision can minimize accuracy fluctuation resulting from thermal changes.

Ultra-precision manufacture eleven meters underground



By using FEM (Finite-Element Method) analysis of the base design, the placement of stiffening ribs and beams has been determined for the Ultra Quick Vision to provide optimal structural rigidity.

SPECIFICATIONS

Model No.		ULTRA QV404 PRO
Range	X-axis	400mm
	Y-axis	400mm
	Z-axis	200mm
Resolution		0.01µm
High-sensitivity CCD camera		B&W
Accuracy* (20°C±0.2°C)	E_{1XY}	(0.25+L/1000)µm
	E_{1Z}	(1.5+2L/1000)µm [(1+2L/1000)µm: 10 - 60mm]
	E_{2XY}	(0.5+2L/1000)µm
Max. drive speed (X/Y/Z-axis)		150mm/sec
Illumination (PRL: Programmable Ring Light)	Surface	Halogen
	Contour	Halogen
	PRL	Halogen
Magnification change system		Programmable power turret
Stage glass size		493 x 551mm
Max. stage loading		40kg
Dimensions (W x D x H)**		1200 x 1735 x 1910mm
Mass**		2150kg

* The measuring accuracy is defined at the following conditions
Programmable power turret: 1X, Objective set: 5X
L = Dimension between two arbitrary points (mm)
** Including machine stand

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Accessories for Quick Vision

Objectives

Objective	Order No.	Working distance
QV-SL0.5X	**02AKT199**	30.5mm
QV-HR1X	**02AKT250**	34mm
QV-SL1X	**02ALA150**	52.5mm
QV-HR2.5X	**02AKT300**	40.6mm
QV-SL2.5X	**02ALA170**	60mm
QV-5X	**02ALA420**	33.5mm
QV-HR10X	**02AKT650**	20mm
QV-10X	**02ALG010**	30.5mm
QV-25X	**02ALG020**	13mm

The monitor magnification and field of view values are for the PRO machine.
QV-10X, QV-25X: Depending on the workpiece the illumination may be insufficient at a turret lens magnification of 2X and 6X.
QV-25X: The PRL illumination is restricted in its usable position.

Objective	Turret lens mag.	Monitor mag.	View Field
QV-SL0.5X	1X	15X	12.54 x 9.4
	2X	30X	6.27 x 4.7
	6X (4X)	90X (60X)	2.09 x 1.56 (3.13 x 2.35)
QV-HR1X QV-SL1X	1X	30X	6.27 x 4.7
	2X	60X	3.13 x 2.35
	6X (4X)	180X (120X)	1.04 x 0.78 (1.56 x 1.17)
QV-HR2.5X QV-SL2.5X	1X	75X	2.5 x 1.88
	2X	150X	1.25 x 0.94
	6X (4X)	450X(300X)	0.41 x 0.31 (0.62 x 0.47)
QV-5X	1X	150X	1.25 x 0.94
	2X	300X	0.62 x 0.47
	6X (4X)	900X (600X)	0.20 x 0.15 (0.31 x 0.23)
QV-HR10X QV-10X	1X	300X	0.62 x 0.47
	2X	600X	0.31 x 0.23
	6X (4X)	1800X (1200X)	0.10 x 0.07 (0.15 x 0.11)
QV-25X	1X	750X	0.25 x 0.18
	2X	1500X	0.12 x 0.09
	6X (4X)	4500X (3000X)	0.04 x 0.03 (0.06 x 0.04)

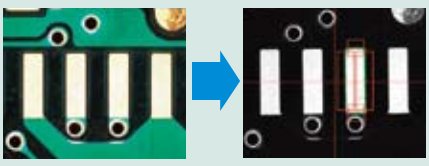
QV Index Head

Automatic multi-plane measurement is possible with the optional index table.

Max. workpiece diameter	140mm
Max. workpiece mass	2kg
Min. rotation angle	0.1°
Positioning accuracy	±0.5°
Max. rotation speed	10rpm

RGB color filtering unit

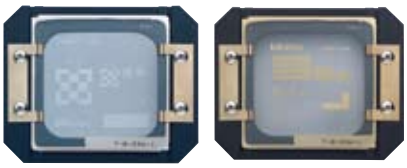
The color filtering function can be added to the vertical reflected illumination or programmable ring light in Quick Vision models that use a halogen light source. This function enhances the visibility of low-reflection surfaces on colored workpieces, facilitating edge detection. This function can also be retrofitted to a conventional Quick Vision. In addition, a yellow filter enables vision measurement in the yellow light region, which provides high sensitivity.



Red filter used

Calibration glass chart & Compensation glass chart

A calibration chart is used to compensate for the pixel size of the CCD chip, autofocus accuracy and the optical axis offset at each magnification of the Programmable Power Turret (PPT).



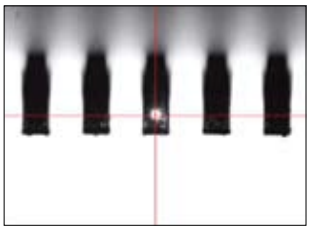
Laser Auto Focus Function*

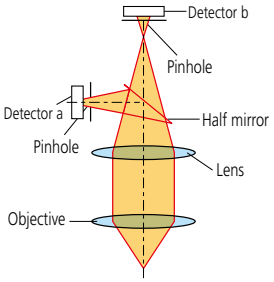
The system can be equipped with the Laser Auto Focus unit that allows a stable, high-speed height measurement during high-speed travel. This unit provides stable measurement results with minimum dependence on surface inclination since the double pinhole method is adopted in the detection system.

*Available for specific models.

Objective	QV-HR2.5X
Measurement principle	Double pinhole method
Laser spot diameter	3μm
Repeatability	σ = 0.4μm

Coaxial laser auto-focus





Example: Height of leads from a QFP package

Laser Beam Safety Precautions

This system uses a low-power visible laser beam which corresponds to a CLASS 1 (visible radiation) of IEC 60825 for measurement. The CLASS 1 laser warning label as shown below is attached to the main unit.

CLASS 1 LASER PRODUCT
クラス 1 レーザ製品

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Mitutoyo

Quick Scope

SERIES 359 — CNC / Manual Vision Measuring System

QS200Z

SPECIFICATIONS

Model No.		QS200	QS250	QS200Z	QS250Z
Range	X-axis	200mm	200mm	200mm	200mm
	Y-axis	200mm	250mm	200mm	250mm
	Z-axis	100mm	100mm	100mm	100mm
Resolution		0.5µm			
Scale type		Linear encoder			
Measuring accuracy (at 20°C)*		XY: (2.5+6L/1000)µm, Z: (5+6L/1000)µm			
Magnification	Objective	2.5X, 1X, 5X	2.5X, 1X, 5X	0.5X - 3.5X zoom	0.5X - 3.5X zoom
	On monitor	105X (at 2.5X)	105X (at 2.5X)	21X - 147X	21X - 147X
Image detecting unit		Color CCD camera			
Illumination		Surface: co-axial light, fiber-optic ring light Contour: stage light			
Stage glass size		269 x 261mm	269 x 311mm	269 x 261mm	269 x 311mm
Max. workpiece height		110mm	110mm	110mm	110mm
Max. stage loading		10kg	10kg	10kg	10kg
Dimensions (W x D x H), Mass		465 x 815 x 663mm, 76kg			

*When using 2.5X objective or the zoom lens in 2.5X magnification (Magnification on monitor: 105X), L = Measuring length (mm)

FEATURES: CNC model

- Surface, contour and fiber-optic ring light illumination options enables users to configure the QS lighting to meet a variety of measurement needs.
- Powerful, Windows® based QSPAK software is easy to use and offers a wide spectrum of measuring and analysis capabilities.
- Functions include zoom, auto-focus, measurement playback, one-click edge detection, graphic display, 48 different macros and a pattern matching function for several common part features.
- The stage can be controlled by mouse or through the optional multi-function control box.

QS-L2010/AFB

SPECIFICATIONS

Model No.		QS-L2010/AFB	QS-L2010Z/AFB	QS-L2010ZB	QS-E2010B
Range (X-axis / Y-axis / Z-axis)		200 x 100 x 150mm			
Resolution		0.1µm			
Scale type		Linear encoder			
Measuring accuracy (at 20°C)*		XY: (2.5+20L/1000)µm, Z: (5+6L/1000)µm			
Magnification	Objective	2.5X, 1X, 5X	0.5X - 3.5X zoom	0.5X - 3.5X zoom	2.5X, 1X, 5X
	On monitor	105X (at 2.5X)	21X - 147X	21X - 147X	105X (at 2.5X)
Image detecting unit		Color CCD camera		Color CMOS camera	
Illumination		Surface: co-axial light, fiber-optic ring light Contour: stage light			
Stage glass size		269 x 261mm	269 x 311mm	269 x 261mm	269 x 311mm
Max. workpiece height		150mm	150mm	150mm	150mm
Max. stage loading		10kg	10kg	10kg	10kg
Dimensions (W x D x H), Mass		618 x 700 x 676mm, 56kg (618 x 752 x 682mm, 57kg: QS-E1020B)			

*When using 2.5X objective or the zoom lens in 2.5X magnification (Magnification on monitor: 105X), L = Measuring length (mm)

FEATURES: Manual model

- Excellent surface observation model for a wide variety of workpieces.
- 0.1µm resolution and 150mm Z-axis range.
- Power zoom enables easy and fast magnification change.
  (QS-L2010/AFB is a fixed-magnification type)
- Fine illumination capability enables lighting changes to match workpiece requirements.
- The quick release system on the stage enables instant switching between coarse movement and fine movement.
- Quick Navigation function enables the user to repeat measurements quickly.
- An auto-focus function is available for QS-L2010/AFB and QS-L2010Z/AFB.

Refer to the QUICK SCOPE leaflet (E4142) for more details.

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Quick Image

SERIES 361 — Non-contact 2-D Vision Measuring System

Refer to the QUICK IMAGE leaflet (E4242) for more details.

Quick Image is a new concept in 2-D vision measuring instruments. It provides unique features for improving measurement efficiency.

FEATURES

- Long focal depth and wide field of view
- Telecentric optical system
- Mega-pixel color CCD camera
- Large quadrant LED ring light

QI-A2010B

QI-B4020B

SPECIFICATIONS

Model		QI-A505B	QI-B505B	QI-A1010B	QI-B1010B	QI-A2010B	QI-B2010B	QI-A2017B	QI-B2017B	QI-A3017B	QI-B3017B	QI-A4020B	QI-B4020B
Range	X, Y-axis	50 x 50mm		100 x 100mm		200 x 100mm		200 x 170mm		300 x 170mm		300 x 170mm	
	Z-axis	25mm		100mm		100mm		100mm		100mm		100mm	
Measuring mode		High-resolution mode and Normal mode											
Accuracy	Within the screen	QI-A models: ±5µm (high-resolution mode), ±8µm (normal mode) [QI-B models: ±2.7µm (high-resolution mode), ±4µm (normal mode)]											
	U_{1XY}	±(5+0.08L)µm L = measuring length (mm)											
Repeatability within the screen (±2σ)		QI-A models: ±1µm (high-resolution mode), ±2µm (normal mode) [QI-B models: ±0.7µm (high-resolution mode), ±1µm (normal mode)]											
CCD camera		Megapixels color CCD camera											
Optical system	Magnification*	0.2X	0.5X	0.2X	0.5X	0.2X	0.5X	0.2X	0.5X	0.2X	0.5X	0.2X	0.5X
	Working distance	90mm											
	Depth of focus	High-resolution mode: ±0.6mm, Normal mode: ±11mm (±1.8mm) ( ): QI-B models											
Illumination	Contour	✔		✔		✔		✔		✔		✔	
	Surface	✔		✔		✔		✔		✔		✔	
	4-quadrant LED	✔		✔		✔		✔		✔		✔	
Stage glass size		86 x 82mm		170 x 170mm		242 x 140mm		260 x 230mm		360 x 230mm		440 x 232mm	
Max. stage loading		5kg		5kg		10kg		20kg		20kg		15kg	
Mass		20kg		70kg		74kg		140kg		148kg		154kg	

*Double telecentric system

Mitutoyo